



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,762	10/22/2003	Ga-Lane Chen	SEA/2666.1	2175
28063	7590	04/05/2006	EXAMINER	
SEAGATE TECHNOLOGY LLC INTELLECTUAL PROPERTY DEPARTMENT 920 DISC DRIVE, MS/SV15B1 SCOTTS VALLEY, CA 95066-4544			BERNATZ, KEVIN M	
			ART UNIT	PAPER NUMBER
			1773	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,762

Applicant(s)

CHEN, GA-LANE

Examiner

Kevin M. Bernatz

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

1. Amendments to the drawings and claims 1 – 3, 7 and 14 - 16, cancellation of claim 9, and addition of new claims 17 and 18, filed on August 16, 2005 and September 28, 2005, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(f) he did not himself invent the subject matter sought to be patented.

4. Claims 1, 2 and 18 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. See Belser et al. (U.S. Patent No. 5,889,641), which has a different inventive entity than the present application but a common assignee (*col. 1, line 66 bridging col. 2, line 45; col. 6, lines 26 – 56; and col. 8, line 11 bridging col. 9, lines 46*). The Examiner notes that Belser et al. does not explicitly disclose using “diamond-like” amorphous carbon as the carbon overcoat, but does teach using amorphous carbon, of which “diamond-like” (or sp^3 carbon) is arguably one of the most common specie for use as a protecting layer in recording media applications. As such, the Examiner does not deem that the present invention is

patentably distinct from the disclosed invention in Belser et al. and a question of inventorship is raised. See MPEP 2137.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belser et al. ('641) as applied above, and further in view of Lambeth et al. (U.S. Patent No. 6,248,416 B1).

Regarding claims 1, 2 and 18, Belser et al. is relied upon as described above.

While the Examiner maintains that the disclosure of "amorphous carbon" as the protective layer has sufficient specificity to anticipate the limitation "diamond-like carbon (which is one of a relatively small specie set of amorphous carbon types known to one of ordinary skill in the art of recording media applications), the Examiner acknowledges that Belser et al. fail to explicitly disclose "diamond-like" carbon.

However, the Examiner deems that the carbon protective coating layers and diamond-like carbon protective layers are known equivalents in the field of protective layers for magnetic and magneto-optic media, as taught by Lambeth et al. (*col. 11, lines 56 – 67*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, carbon protective layers and diamond-like carbon protective layers are equivalents in the field of protective layers for use in magnetic and magneto-optic media applications. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Regarding claim 12, Lambeth et al. disclose a storage disk comprises a magneto-optical (MO) type media having a superlattice multilayer wherein such a media is taught to possess strong perpendicular magnetic orientation (*col. 25, lines 45 – 55 and col. 28, lines 8 – 18*).

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belser et al. in view of Lambeth et al. as applied above, and further in view of Tang et al. (U.S. Patent No. 5,750,270).

Belser et al. and Lambeth et al. are relied upon as described above.

Neither of the above disclose the specific layer structure as claimed in claims 14 and 15.

However, Tang et al. teach that the recited structure is known in the art for magnetic superlattice structures possessing high coercivity, high anisotropy and high recording density (*col. 8, line 40 bridging col. 10, line 53*). The Examiner notes that these properties are beneficial for both magnetic and magneto-optic applications.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Belser et al. in view of Lambeth et al. to utilize the claimed recording medium structure as taught by Tang et al., since such a superlattice structure is known in the art as capable of possessing high coercivity, high anisotropy and high recording density.

8. Claims 3, 7, 8, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belser et al. in view of Lambeth et al. as applied above, and further in view of Nakajima et al. (JP 09-198731 A) and Knight et al. (U.S. Patent No. 6,449,221 B1). See Machine Translation and JPO Abstract Translation of JP '731 A, already of record.

Belser et al. and Lambeth et al. are relied upon as described above.

Regarding claim 3, Nakajima et al. disclose a MO media meeting applicant's claimed structural limitations, but in an inverted order, for use as a magneto-optic medium having good CNR and increased recording density (JPO Abstract; *Figure 1; and Paragraphs 0019 – 0034*).

However, Knight et al. teach that when using a first surface recording medium as opposed to a substrate-incident recording medium, the orders of the layers between the dielectric layers are inverted, thereby resulting in a structure reading on applicants' claimed limitations (*Figures 28A and 28B and col. 30, line 9 bridging col. 31, line 32*). The Examiner notes that first-surface recording is known to allow for smaller head-to-medium spacing, thereby allowing increased recording density.

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Belser et al. in view of Lambeth et al. to meet applicant's claimed structural and material limitations as taught by Nakajima et al. and Knight et al., since such a structure results in a first-surface recording medium having increased recording density.

Regarding claims 7, 8, 13 and 16, Nakajima et al. disclose materials meeting applicant's claimed limitations (*Paragraphs 0019 – 0034*).

Regarding claim 17, Lambeth et al. teach PFPE lubricants as known lubricants for use on magneto-optical media over a diamond-like carbon protective layer (*col. 11, lines 56 – 67*).

9. Claims 1, 2, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hintz (U.S. Patent No. 5,353,268) in view of Lambeth et al. ('416 B1).

Regarding claim 1, Hintz discloses a storage system comprising a magnetic recording head comprising a MR sensor (*col. 1, lines 42 – 61; col. 6, line 36 bridging col. 8, line 8*) and a MO media comprising a carbon overcoat layer and a lubrication layer formed on at least one surface thereof (*col. 3, lines 33 – 59; col. 5, lines 49 – 63; col. 7, lines 10 - 21; Figures 1 and 2; and examples*), wherein the MO media is a perpendicular media (*col. 1, lines 18 – 34*) and capable of being read using a laser beam, and further wherein the storage system is a hybrid recording device wherein said magnetic head comprising the MR sensor reads and writes data on said MO media (*col. 6, line 36 bridging col. 8, line 8*).

Hintz fails to disclose a diamond-like carbon coating.

However, the Examiner deems that the carbon protective coating layers and diamond-like carbon protective layers are known equivalents in the field of protective layers for magnetic and magneto-optic media, as taught by Lambeth et al. (*col. 11, lines 56 – 67*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, carbon protective layers and diamond-like carbon protective layers are equivalents in the field of protective layers for use in magnetic and magneto-optic media applications. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Regarding claim 2, Hintz discloses media meeting applicants' claimed limitations (*col. 7, lines 4 – 6*).

Regarding claim 12, Lambeth et al. disclose a storage disk comprises a magneto-optical (MO) type media having a superlattice multilayer wherein such a media is taught to possess strong perpendicular magnetic orientation (*col. 25, lines 45 – 55 and col. 28, lines 8 – 18*).

Regarding claim 17, Hintz discloses PFPE lubricants (*col. 7, lines 10 – 21*).

Regarding claim 18, Hintz discloses RE-TM magneto-optic layers (*examples*).

Art Unit: 1773

10. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hintz in view of Lambeth et al. as applied above, and further in view of Tang et al. ('270).

Hintz and Lambeth et al. are relied upon as described above.

Neither of the above disclose the specific layer structure as claimed in claims 14 and 15.

However, Tang et al. teach that the recited structure is known in the art for magnetic superlattice structures possessing high coercivity, high anisotropy and high recording density (*col. 8, line 40 bridging col. 10, line 53*). The Examiner notes that these properties are beneficial for both magnetic and magneto-optic applications.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Hintz in view of Lambeth et al. to utilize the claimed recording medium structure as taught by Tang et al., since such a superlattice structure is known in the art as capable of possessing high coercivity, high anisotropy and high recording density.

11. Claims 3, 7, 8, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hintz in view of Lambeth et al. as applied above, and further in view of Nakajima et al. (JP '731 A) and Knight et al. ('221 B1). See Machine Translation and JPO Abstract Translation of JP '731 A, already of record.

Hintz and Lambeth et al. are relied upon as described above.

Regarding claim 3, Nakajima et al. disclose a MO media meeting applicant's claimed structural limitations, but in an inverted order, for use as a magneto-optic medium having good CNR and increased recording density (JPO Abstract; *Figure 1; and Paragraphs 0019 – 0034*).

However, Knight et al. teach that when using a first surface recording medium as opposed to a substrate-incident recording medium, the orders of the layers between the dielectric layers are inverted, thereby resulting in a structure reading on applicants' claimed limitations (*Figures 28A and 28B and col. 30, line 9 bridging col. 31, line 32*). The Examiner notes that first-surface recording is known to allow for smaller head-to-medium spacing, thereby allowing increased recording density.

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Hintz in view of Lambeth et al. to meet applicant's claimed structural and material limitations as taught by Nakajima et al. and Knight et al., since such a structure results in a first-surface recording medium having increased recording density.

Regarding claims 7, 8, 13 and 16, Nakajima et al. disclose materials meeting applicant's claimed limitations (*Paragraphs 0019 – 0034*).

Response to Arguments

12. The rejection of claims 1, 2, 3, 9, 14, 15 under 35 U.S.C § 112 – 1st and 2nd

Paragraphs

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations overcoming the prior 112 1st and 2nd Paragraph rejections.

13. The rejection of claims 1, 12, 14 and 15 under 35 U.S.C § 102(e) and/or 103(a) – Lambeth et al., alone or in view of Tang et al.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. amendments to claim 1) no longer anticipated, nor rendered obvious, by the above noted rejection.

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection.

14. The rejection of claims 1 – 3, 7 – 9, 13 and 16 under 35 U.S.C § 103(a) – Nakajima et al. in view of various references

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. amendments to claim 1) no longer anticipated, nor rendered obvious, by the above noted rejection.

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection.

15. The rejection of claims 1 – 8 and 10 - 18 under 35 U.S.C § 102(f) and/or 103(a) – Belser et al., alone or in view of various references

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection.

16. The rejection of claims 1 – 8 and 10 - 18 under 35 U.S.C § 103(a) – Hintz, alone or in view of various references

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hatam-Tabrizi (U.S. Patent No. 6,104,675) teach a magneto-optic medium including a protective layer for use in near-field (air-incident) recording with a combined/hybrid magneto-optic + magnetic head, but fail to specify a lubricant layer is also used or that the magnetic head utilizes a magnetoresistive (MR) transducer. The Examiner notes that a 103-type rejection could have been made using the above noted reference, but that the rejections of record are deemed to be directed to the closest prior art and any amendments/arguments sufficient to overcome the above noted rejections would be reasonably expected to overcome a rejection predicated upon the Hatam-Tabrizi teachings.

Rottmayer et al. (U.S. Patent No. 5,986,978) teach a MO head including a GMR element, but does not provide any specifics of the medium. The Examiner notes that a 103-type rejection could have been made using the above noted reference, but that the rejections of record are deemed to be directed to the closest prior art and any amendments/arguments sufficient to overcome the above noted rejections would be reasonably expected to overcome a rejection predicated upon the Rottmayer et al. teachings.

Chen (U.S. Patent No. 6,324,131 B1), Chen (U.S. Patent No. 6,319,583 B1) and Chen (U.S. Patent No. 6,268,073 B1) all teach magneto-optic media possessing a diamond-like carbon protective layer and a PFPE lubricant meeting applicants' claimed medium-limitations. However, none of the Chen references provide any teaching on the details of the combined/hybrid head structure.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1773

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

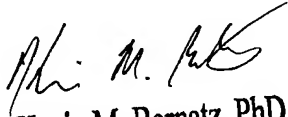
Applicant's amendment resulted in embodiments not previously considered (i.e. amendments to claim 1) which necessitated the new grounds of rejection, and hence the finality of this action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
March 30, 2006


Kevin M. Bernatz, PhD
Primary Examiner